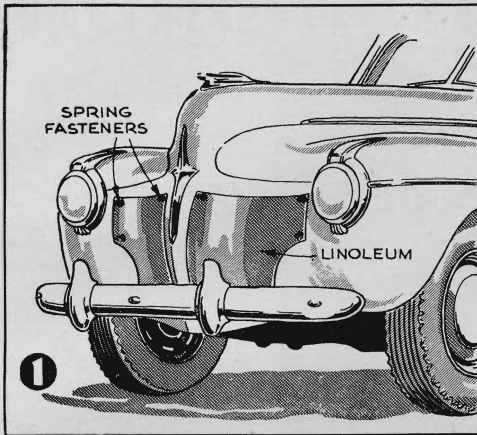
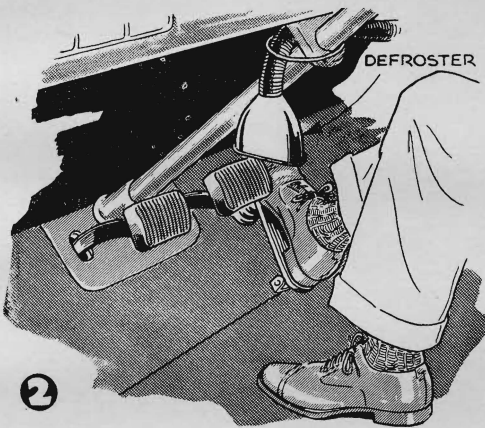


USEFUL AUTO HINTS



1 INEXPENSIVE WINTER FRONTS that will look well and give excellent service can be made from scrap pieces of linoleum. Cut the linoleum carefully to fit the radiator grill and attach it with regular spring fasteners after punching a hole in each of the corners. Finish with a coat of good-quality aluminum paint.—C. R. G.

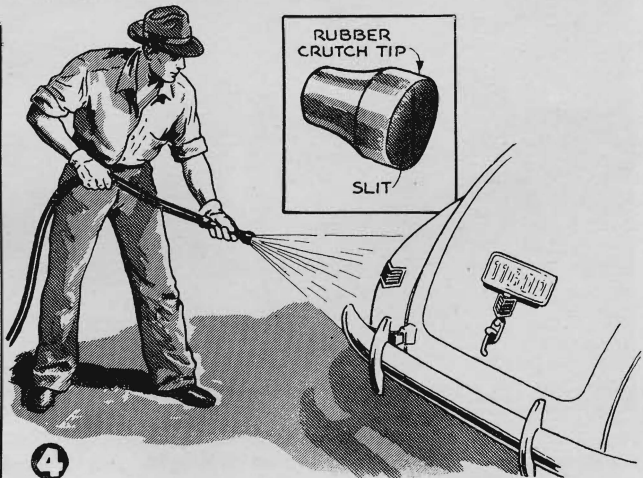
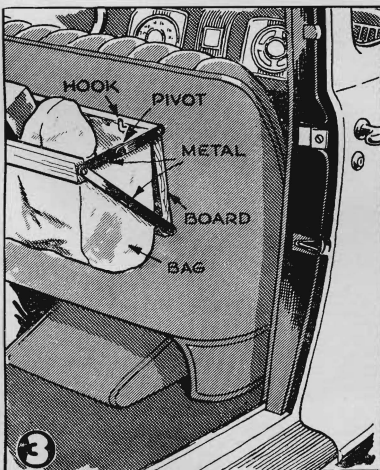


2 A DEFROSTER TUBE can be used to keep a driver's feet warm when the heater is remote from him, as heaters are in some cars. The device is sure to prove a great comfort in very cold weather, and only a few minutes are needed to install it. Secure one end of the tube to the heater and run it under the cowl to the steering post. Clamp the tube to the post, pointing it downward as shown at the left. This will provide a flow of warm air where it is needed.—C. B.

3 PACKAGE HOLDER. This will carry a lot of bundles and fold flat against the front seat when not in use. It requires a 36" long board, a similar length of $\frac{3}{4}$ " by 1" stock, a piece of canvas, and some strap iron. Hung on two hooks screwed into the seat back, it is readily detachable. A small catch will hold it firmly in the folded position when it is empty.—M. G.

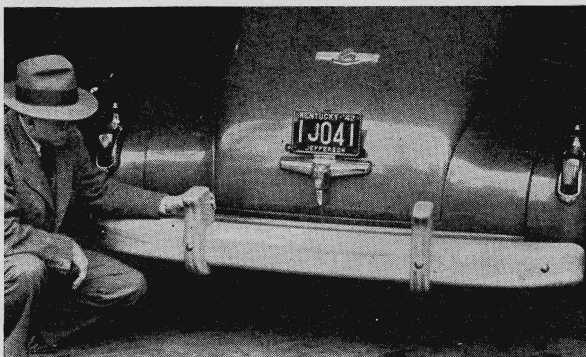
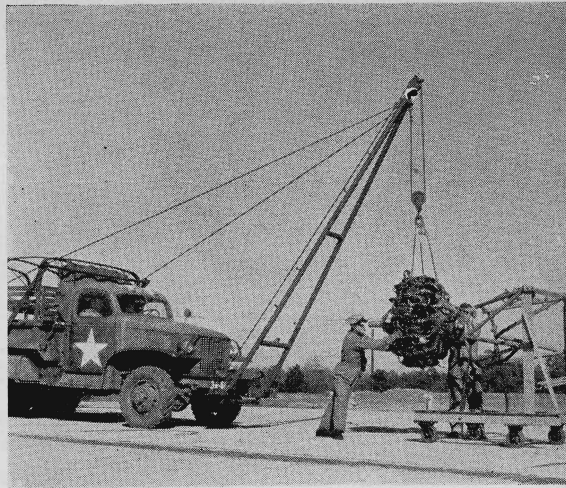
4 WASHING CARS is often made easier by a hose nozzle that will project a thin, flat stream of water. Such a nozzle can be fashioned out of a rubber tip like those used on the ends of crutches. Simply cut a slit with a knife across the closed end of the tip, and twist the open end onto the threaded coupling of the hose.—A. H. W.

Drawings by William Patrick.



AUTO Ideas

A PORTABLE HOIST capable of handling 8,000-lb. planes has been developed for use on 2½-ton Army trucks by Lieut. Col. James H. Reed, Jr., of the Air Corps. Designed for winch-equipped vehicles, the hoist is made principally of two lengths of 3½" iron pipe and a wire cable which anchors it to the truck. The hoist rests on the front bumper, and the cable extends from the apex of the hoist to the rear of the truck, where it is fastened with clamps. Brackets at the side of the truck carry the hoist when it is not in use.



WOODEN BUMPERS made of laminated maple bonded with a resin adhesive, like the one at the left, have been subjected to tests that indicate they will withstand an even greater shock than comparable steel bumpers. As an additional advantage, it is claimed for the wooden bumpers that they can be polished very quickly if scratched. Even chunks chipped out of them can be replaced and the scars hidden beneath a new finish. The weight of the laminated type is slightly less than that of steel bumpers.

THIS CAR-TOP RACK is held securely in place on top of the car by ⅛" by ½" steel clamps that clutch the roof gutters and are drawn taut with turnbuckles attached to ⅛" cables. The cables are passed through screw eyes installed along the inside length of two 1" thick wooden transverse supports. If these supports are made to conform to the contour of the car top, they can be secured firmly with a minimum of tension. Glue felt or some other soft material to the bottom to protect the car finish. The platform is made of 1" by 3" pieces spaced 3" apart. Paint the unit to match the car.—E. W. L.



Think-OF AN IDEA!

If you would like to let others know about your pet auto tip—and get paid generously for doing so—just write your idea in 100 words or less, draw rough sketches, and send them to the Automobile Editor, **POPULAR SCIENCE MONTHLY**, 353 Fourth Avenue, New York 10, N.Y.

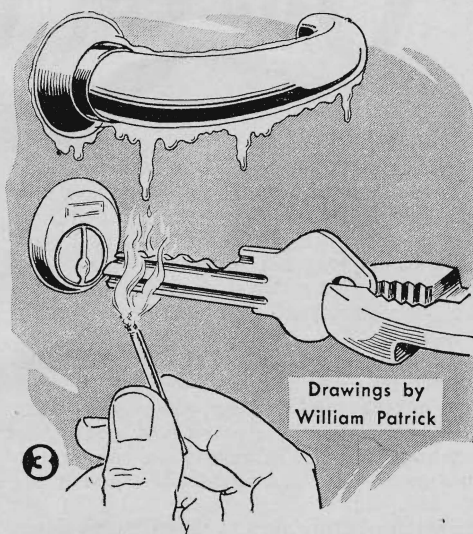
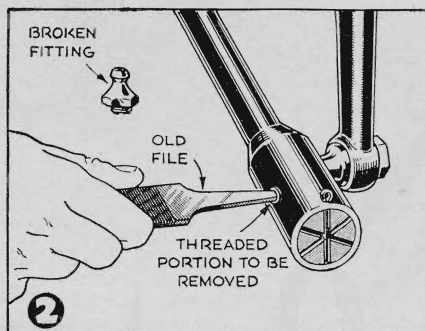
ANTIFREEZE SOLUTIONS, used all last winter and saved for re-use this season, can have their rust-inhibiting properties restored by the addition of a chemical inhibitor originally developed for the Army and recently made available to the public. Although the new compound does not contribute to the antifreeze properties, it does neutralize those solutions that have become acid through extended use. When treating a solution, it is advisable also to filter it in order to remove dirt and rust particles which might impair cooling-system efficiency.

USEFUL AUTO HINTS



1 ICE ON CAR WINDOWS can be removed handily with the aid of a homemade scraper that can be put together in a few minutes. For the blade of the tool a stiff material—such as a fiber or a plastic that can be beveled to an edge—should be used. Avoid metals hard enough to be likely to scratch glass.—D. V. D.

2 BROKEN GREASE FITTINGS often present a difficult repair problem because of the shank left embedded in the threaded hole. Such a shank can usually be removed with the tang of a small file. If not stuck too tightly, the shank can be retrieved by tapping the tang lightly into the hole and twisting so as to unscrew the broken part. With the aid of a wrench, apply just enough torsion to turn out the shank without breaking the file.—L. R. F.



3 A FROZEN DOOR LOCK will yield quickly to thawing if the key is heated over a match flame and inserted in the key-hole while it is still hot. If the lock is frozen solidly, it may be necessary to repeat the operation a few times. Hold the key with pliers, for brass conducts heat very rapidly, and a key hot enough to melt the ice may be too hot for the hand.—G. T.

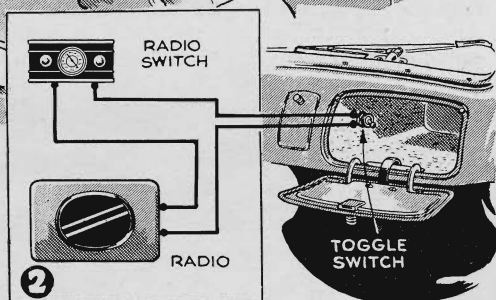
4 THAT EXTRA CUSHION, so comfortable to some drivers on long trips, will not get kicked around on the car floor if it is neatly and conveniently suspended from the seat back. Hang the cushion on a pair of straps, so that it can be flipped over the seat and into place behind the driver's back whenever it is wanted.—H. S.



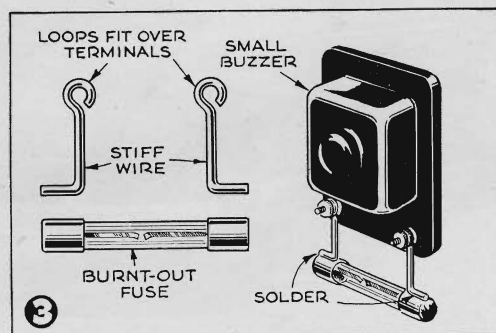
USEFUL AUTO HINTS



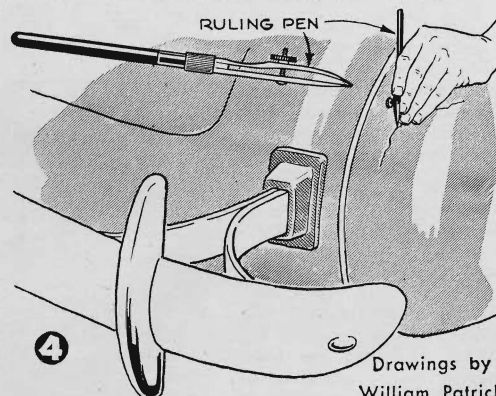
1 RADIATOR FILLING CAPS in many recent-model cars are located in such a position that it is difficult to check on water level without head-bumping or gymnastics. If a small mirror is cemented to the underside of the hood or bolted to a brace, the liquid level can be easily seen.—W. E. B.



2 A SECRET RADIO SWITCH will prove handy in circumstances where a car must be left unlocked, as in many parking lots or garages. A toggle switch, wired in series with the regular radio switch and installed in the glove compartment (which in most cars can be locked), will help prevent this annoying battery drain.—R. W.



3 HUNTING DOWN SHORT CIRCUITS in auto wiring is simplified by this device. It consists of a small 6-volt buzzer, mounted as shown on a burnt-out fuse. When a regular fuse blows, replace it with this test rig, which will give an audible signal to indicate the short. An interruption of the sound means that the short is temporarily removed. Listen also for changes in pitch of the buzzer, since they may signal removal of the short with continuing flow of the current through a headlight or other load.—R. K.



4 TOUCHING UP SCRATCHES on a car fender or body is easily and inconspicuously done with a ruling pen of the type used by draftsmen. It can be adjusted quickly to the required width, and it tends to follow the groove of a scratch, thereby contributing toward a neat job.—H. F. R.

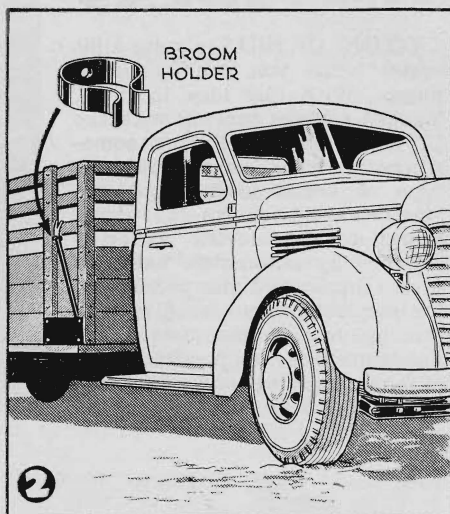
Drawings by
William Patrick

USEFUL AUTO HINTS

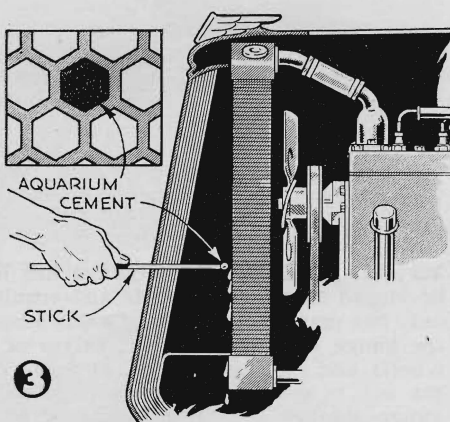


1 DENTS IN HUB CAPS can be removed easily by backing the damaged cap with sand and hammering lightly from the inside with a ball peen. Fill a bucket with sand piled in loosely, lay a cloth over it to guard against scratching the finish, put the cap on the cloth, as shown, and press and twist it a little to bed it down.—A. H. W.

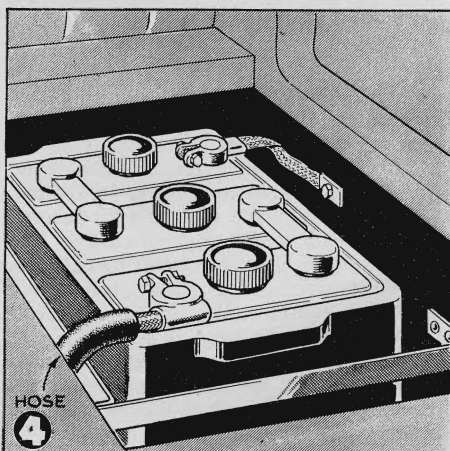
2 KEEPING A CROWBAR on the side of a truck, where it can be reached when needed and won't clatter on the floor and endanger cargo being hauled, is made possible with an ordinary broom holder of the type carried by hardware dealers, 10-cent stores, and the like. Attach the broom bracket to the truck near the top end of the crowbar. Two pieces of strap iron or a sheet of tin at the bottom will keep the lower end from slipping out.—N. B. S.



3 LEAKS IN A RADIATOR CORE can be stopped efficiently with a little ordinary aquarium cement pressed into the holes in the core from both sides. The material is soft enough to be worked with a stick pushed through the front grille. It will set in contact with water, so it is unnecessary to drain the radiator.—F. J. B.



4 BATTERY-CABLE INSULATION that has corroded and begun to peel can be covered with old garden hose in a simple repair that may outlast the cable itself. Garden hose will usually slip over the fitting at the starter end of the cable, but in some cases the battery connection must be taken off and then soldered back after the hose has been put on.—A. W. H.



AUTO Ideas

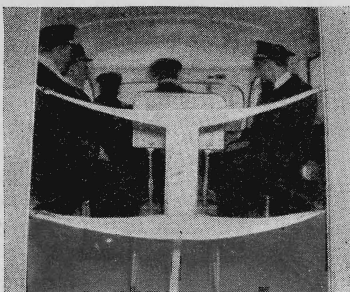
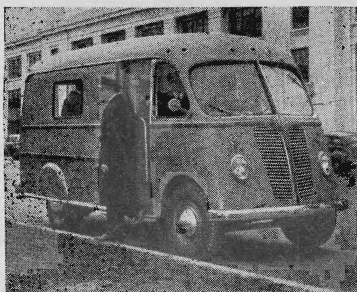
AUTOMATIC PARKING with no handling of cars by attendants is to be provided for in a 12-level prefabricated building that can be set up on a plot 30' by 60'. A car is taken from the entrance by a device that grasps its bumper and slides it to an elevator, where it is carried to the designated level. There it is again taken by an automatic device and placed in an individual stall. A reverse process delivers the car at an exit. Every movement of the car from entrance to exit is controlled by one man punching buttons on a master panel near the door. The structure is to be made by the Park-O-Mat Company, of Los Angeles.



PART-TIME BUSES that serve as trucks when not needed for passengers are being used by the Navy and may be developed for civilian application after the war. Some 400 of these novel vehicles now move personnel and equipment in all 15 naval districts in

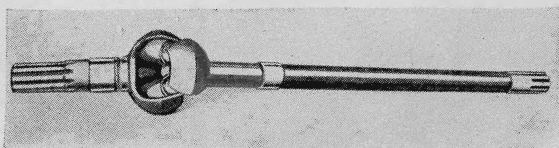
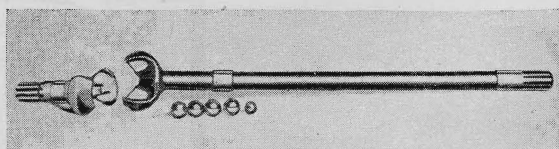
this country. The bus-truck combination was originally a light-delivery unit for bulky loads built on a one-ton International chassis with a 113" wheel base. Side windows were cut and sash fitted in the man-high Metro body, and folding longitudinal side

seats and removable center seats were installed in the 6' wide, 9½' long space behind the driver's seat. The buses carry 18 seated passengers and seven standees. In Navy service they average 10.9 miles to the gallon of gasoline while following schedules on regular routes.

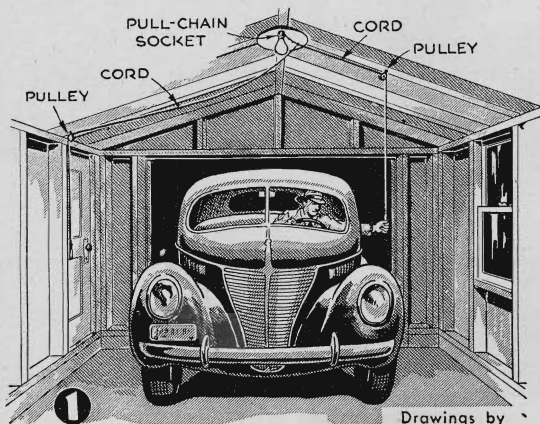


A UNIVERSAL JOINT made by the Bendix Aviation Corporation, of South Bend, Ind., for jeeps and multiple-drive military trucks is a revolutionary departure from the type found in four-wheel drive cars before the war. The basic units of this Bendix-Weiss "constant velocity" joint are two yokes and five steel balls that transmit power from the differential to the driving wheels. They allow for a maximum angle of 37 deg. for steering, transmitting power uniformly at all angles. Their ball-bearing principle permits a simplified design that eliminates the sliding splines necessary to allow end motion in earlier joints made for the same purpose, thus minimizing lubrication and maintenance problems.

The joints are so compact that they permit any desired surrounding construction and do away with the floor tunnel sometimes used in rear passenger compartments to give clearance for the propeller shaft.

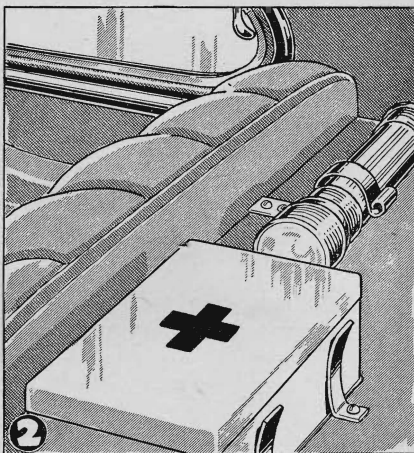


USEFUL AUTO HINTS



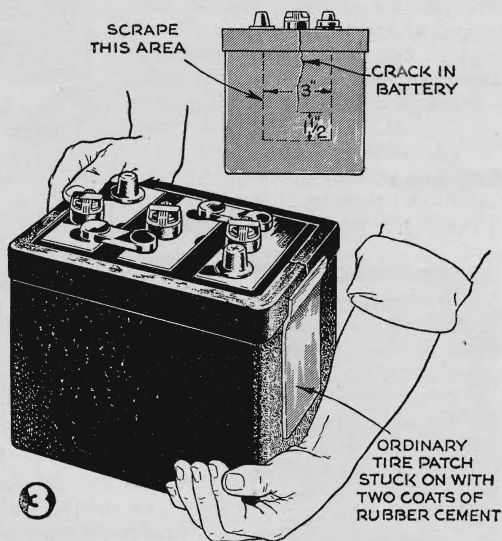
Drawings by
William Patrick

1 A LIGHT IN A GARAGE may be turned on or off both from the front seat of a car and from the house entrance or garage door by installing a pull-chain socket for the bulb and arranging pulleys and extension cords as shown in the drawing. The main switch should then always be left on so the light circuit can be closed or opened by the pull-chain switch.

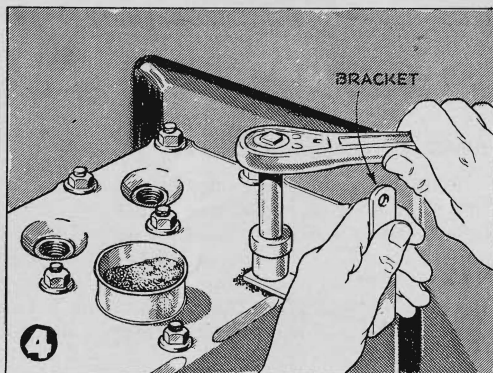


2 FIRST-AID EQUIPMENT, a flashlight, a fire extinguisher, pliers, an adjustment wrench, and other small tools can be kept efficiently without rattling in the space just in front of the rear window by installing wood cleats and various metal clips of the type found in 10-cent stores. This saves the glove compartment—often cluttered with articles of this kind—for road maps and the like, which are frequently needed more urgently.—J. A. A.

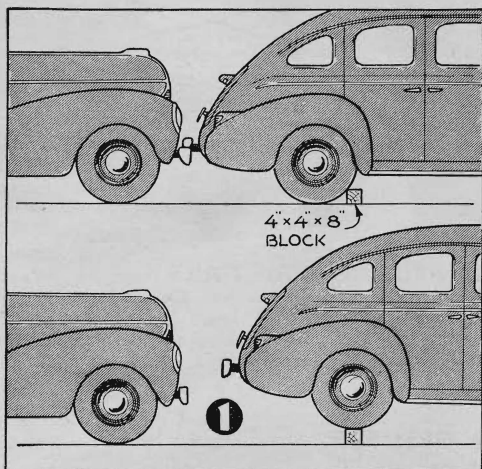
3 BATTERY FAILURE caused by leakage through a crack in the case at an end cell can be forestalled in an emergency with an ordinary tire patch. Scrape down the case with a chisel and sandpaper, making a smooth, rectangular area about $1\frac{1}{2}$ " around the crack; then apply rubber cement to this spot and the patch, and stick the patch on. Replace lost fluid with electrolyte of the proper specific gravity.—J. W. M.



4 VALVE-GRINDING COMPOUND placed on the underside of brackets held to a cylinder head by the nuts on the cylinder-head studs will keep these fixtures from turning annoyingly when the nuts are tightened. A small amount of compound is enough to provide a firm grip between a bracket and the cylinder head.—R. D. L.

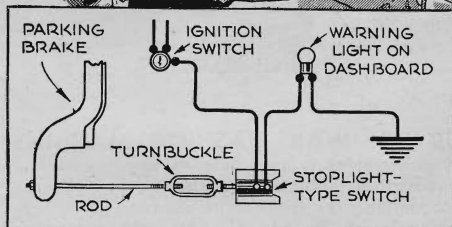


USEFUL AUTO HINTS



1 LOCKED BUMPERS can be released with a minimum of effort if you carry in your tool compartment a pair of 4" by 4" blocks that can be placed against the wheels of the car having the uppermost bumper. Start this car slowly, and be ready to stop the other car as soon as the wheels of the first mount the blocks and the bumper clears—this keeps the following car from crashing into the raised bumper.—H. L. K.

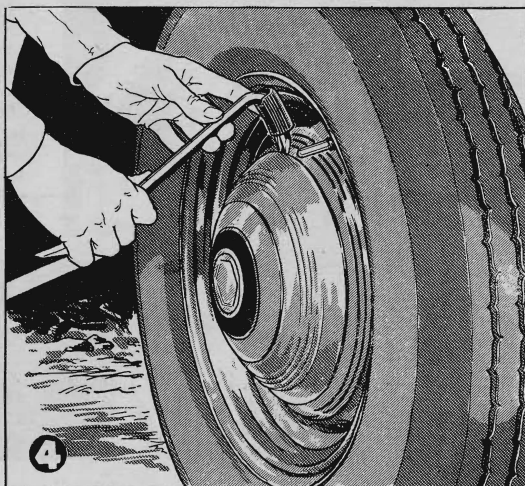
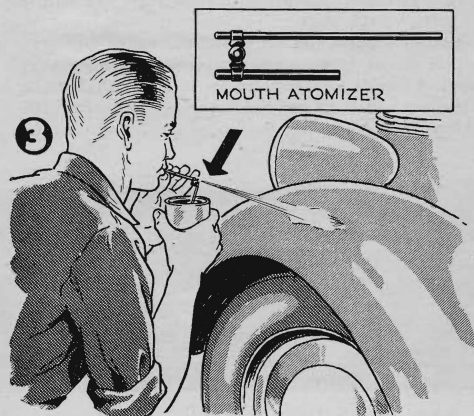
2 FORGETTING TO RELEASE A HAND BRAKE is guarded against by rigging up a warning light on the dashboard. Drill the brake lever to take a rod attached through a turnbuckle to a switch of the kind used for stop lights. Connect the wire at the ignition-switch coil terminal, so that the signal is given only when the ignition is on.—A. M.



3 TOUCHING-UP JOBS where paint has been knocked off your car may be done without fear of brush marks or laps if you use a mouth atomizer of the type sold by art-supply stores. Sand off loose paint and rust before applying the new enamel, and practice with the atomizer and enamel against a sheet of metal to get blowing force and distance right.—E. S. M.

4 REMOVAL OF A HUB CAP is accomplished without marring the finish on the wheel if a small ripping bar of the type shown is fitted with a short length cut from ordinary garden hose. A notch may be needed in one end of the hose so it will go up over the gooseneck.—W. E. B.

Drawings by William Patrick



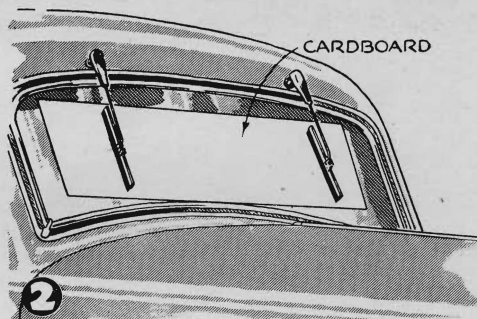
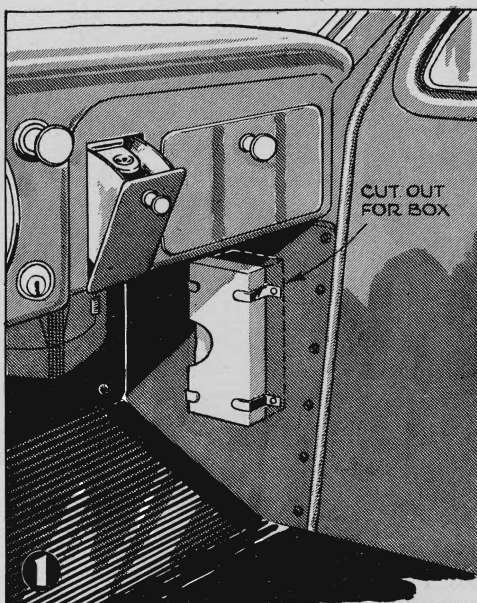
USEFUL AUTO HINTS

1 DISPOSABLE TISSUES are always handy to keep in a car for removing grease from the hands, cleaning the windshield, and similar purposes. Instead of cluttering the glove compartment with the box, cut a rectangular hole in the fiber paneling and secure the box in place with metal clips. If you do not cut the paneling, an extra clip is of course needed under the box.—S. J. D.

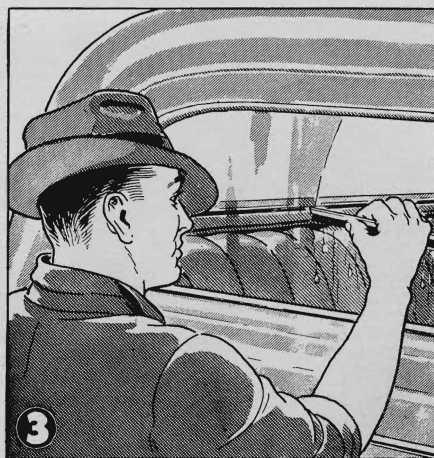
2 FROST AND SNOW on the windshield are a constant nuisance if you have to keep your car outside overnight in the winter. To avoid the bother of having to clean off the glass each morning, put a sheet of cardboard under the wiper blade when you park the car. Use separate sheets on a car having a divided windshield. It's much simpler to pull off the cardboard than to scrape away frozen snow and sleet.—J. J. B.

3 CLEANING CAR WINDOWS without lint or streaks is easy if you unhook the blade from the windshield-wiper arm and use it as a squeegee to remove the excess water. Most wiper blades can be readily disconnected without tools. One advantage of this method is that you always know where you can find the squeegee.—W. E. B.

4 LOCATING A LEAK in a gas line, a manifold-vacuum line, or other metal or rubber tubing is sometimes difficult to do visually or by the sound of air hissing out. However, if you block one end and blow a puff of tobacco smoke into the other, it's simple to spot where the trouble lies.—H. W. S.



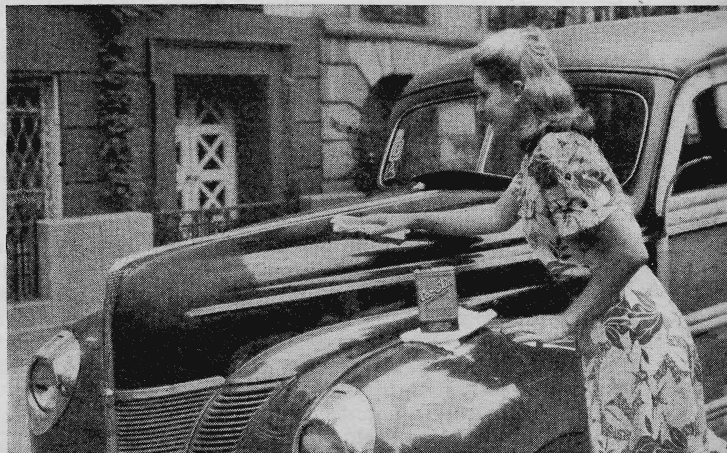
Drawings by
William Patrick



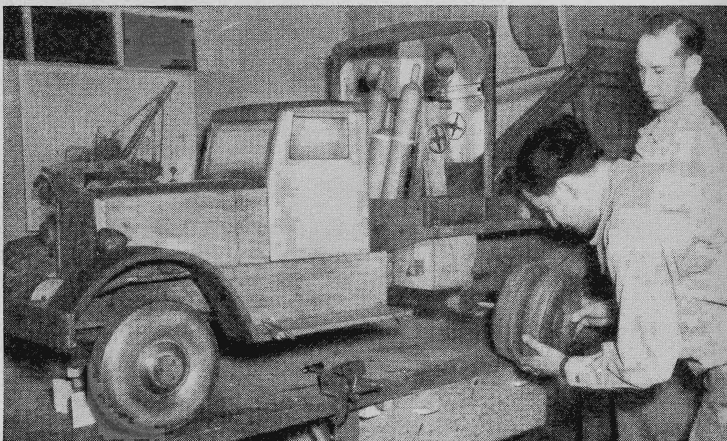
POSTWAR BUSES as well as postwar cars are receiving the attention of designers and manufacturers, many of whom are showing a decided tendency toward streamlining. The model of a highway bus shown in the photograph at the right is the design of Montgomery Ferar. It was put on display at a show staged in Detroit by leading industrial designers of that automobile center to present their ideas for postwar development. The teardrop style is a design feature.



ROAD FILM, scum and blemishes, and oxidation are removed from the finish of a car with the application of a new cleanser and reconditioner that can be rubbed on simply with a cloth after the car has been washed free of dust and mud. A sealer, also made by the Car-Skin Products Company, of New York, and applied with a clean cloth after the finish has been restored by the reconditioner, will seal the color against the elements for several months.



STRETCHING engine lubricant, so that it spreads thinner and further and will get into fine clearances at lower temperatures than untreated oil will, is made possible with a product of the Pyroil Company, of La Crosse, Wis. The penetrating solution is also said to have the property of halting internal corrosion.



CAMOUFLAGING WRECKERS to protect them from enemy fire is studied at the Aberdeen Proving Ground in Maryland by practice on the model shown above, which was built in the model shop of the Ordnance Replacement Training Center at Aberdeen. Because of their usefulness, wreckers have been favorite targets of enemy planes.